CANDIDATE'S INDEX NUMBER:
SIGNATURE:

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
SCHOOL OF EDUCATIONAL DEVELOPMENT AND OUTREACH
INSTITUTE OF EDUCATION

FOUR-SEMESTER BACHELOR OF EDUCATION PROGRAMME
THIRD YEAR, END-OF-FIRST SEMESTER EXAMINATION, APRIL, 2021

APRIL 7, 2021   PEDAGOGICAL CONTENT   2:00 PM – 2:30 PM
KNOWLEDGE IN MATHEMATICS

This paper consists of two Sections, A and B. Answer ALL the questions in Section A and THREE questions in Section B. Section A will be collected after the <u>first 30 minutes.</u>

SECTION A
(40 MARKS)

Answer all the questions in this Section.

For items 1 to 20, each stem is followed by four options lettered A - D. Read each statement carefully and circle the letter that bears the correct or best option.
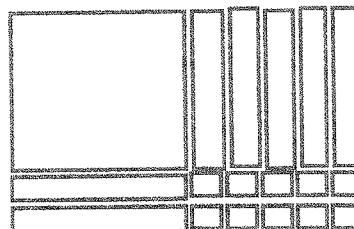
1. The type of mathematics tasks that has the highest potential for training students in self-directed exploration is known as ....
   A. comprehension.
   B. exercise.
   C. investigation.
   D. problem.

2. One way a teacher contributes to student mathematics anxiety is the practice of ....
   A. emphasising memorization during the teaching-learning process.
   B. employing indirect teaching strategies in the teaching-learning process.
   C. engaging students in relevant cooperative learning activities.
   D. showing a lot of sensitive behaviour toward students in class.

3. Which one of the following statements about measures of dispersion in statistics is **always** true?
   A. Standard deviation is the square of the variance.
   B. Square root of the mean is the standard deviation.
   C. Variance is the square of the standard deviation.
   D. Variance is the sum of the squared deviations from the mean.

4. An appropriate outcome for a student's inappropriate act is a description that best fits the term
   ....
   A. anxiety.
   B. consequence.
   C. motivation.
   D. reinforcement.

5. Which of the following is a correct pair of features related with high achievement of students in mathematics and which the teacher must bear in mind when planning for a mathematics lesson?
   A. Attention and Evaluation.
   B. Initiative and Implementation.
   C. Success and Evaluation.
   D. Success and Initiative.

6. Effective mathematics teaching requires that the teacher has to ....
   A. always make himself or herself an answer machine.
   B. avoid variations in teaching strategies used in lesson delivery.
   C. do teacher reflections and self-evaluation for lessons taught.
   D. regularly show insensitive feelings towards students.

7. Which of the following classroom management styles has a high potential of helping to produce students who are socially competent and responsible?
   A. Authoritarian.
   B. Authoritative.
   C. Indulgent.
   D. Permissive.

8. An individual's *feeling of apprehension and fear that interferes with his or her performance in mathematics* describes the psychological term in mathematics called a/an ....
   A. anxiety.
   B. axiom.
   C. myth.
   D. pedagogy.

9. Which of the following expressions is/are illustrated by the "algebra tiles diagram" below?
   I. $x^2 + 5x + 10$
   II. $x^2 + 7x + 10$
   III. $(x+5)(x+7)$

   A. I only
   B. II only
   C. I & III only
   D. II & III only

10. The aspect of a subject which provides an answer to the question of *what to teach* is referred to as ....
    A. agogus.
    B. content.
    C. paidos.
    D. pedagogy.

11. *The size of an angle subtended by a chord at centre of a circle is equal to the size of the angle the chord subtends at the circumference.* This statement is ....
    A. always true.
    B. neither true nor false.
    C. never true.
    D. sometimes true.

12. Which of the following **are** appropriate techniques for motivating students in mathematics?
    I.   Calling attention to a void in students' knowledge
    II. Minimizing active student involvement in justifying their curiosities
    III. Regularly using recreational mathematics in class
    A. I, II & III
    B. II & III only
    C. I & II only
    D. I & III only

13. A general strategy which is independent of any particular subject matter, that helps problem solvers to approach a problem and efficiently marshal resources to solve it is referred to as a/an ....
    A. heuristic.
    B. ideal.
    C. investigation.
    D. solution.

14. The teaching strategy in mathematics that involves posing a mathematics task to students and giving them about a minute to ponder as individuals, then to team up with a peer for discussion and then later discuss their solutions with the rest of class is termed .... strategy.
    A. Before-During-After
    B. Think- Before - Share
    C. Think-Pair-Share
    D. Three-Part-Structure

15. What is the term used in Shulman's Model to describe *teacher's ability to change content knowledge into pedagogically powerful forms to fit the variety of student abilities?*
    A. Adaptation.
    B. Comprehension.
    C. Instruction.
    D. Transformation.

16. In mathematics, knowledge that by its nature is *knowledge understood* is often referred to as
.... mathematical knowledge.
   A. comprehensive
   B. conceptual
   C. contextual
   D. procedural

17. Which of the following statements are **always true** about a circle?
   - I. Angles subtended by an arc in the same segment are similar.
   - II. The diameter of a circle subtends a right angle at the circumference.
   - III. Opposite angles of a cyclic quadrilateral are supplementary.

   A. I & II only
   B. I & III only
   C. II & III only
   D. I, II & III

18. Which of the following statements is **true**?
   A. Procedural mathematics knowledge is also known as imperative mathematics knowledge.
   B. Procedural mathematics knowledge is also known as conceptual mathematics knowledge.
   C. Conceptual mathematics knowledge is also known as imperative mathematics knowledge.
   D. Imperative mathematics knowledge is also known as logico-mathematical knowledge.

Use the Venn diagram below to answer questions 19 and 20.

$\mathcal{E}$ = Attribute shapes
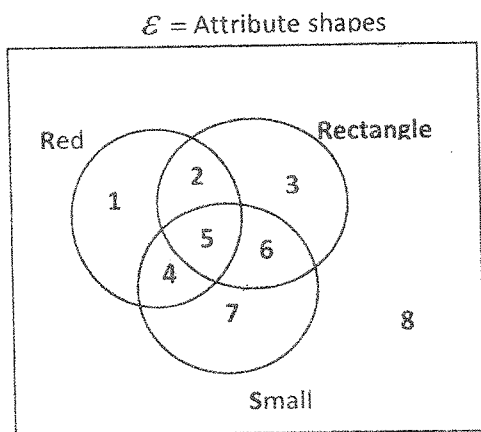
19. Which one of the following regions can contain *a red rectangle*?
   A. 2
   B. 3
   C. 6
   D. 8

20. Which of the following attributes can fit region 4?
   A. Red triangles.
   B. Red but small rectangles.
   C. Small red rectangles.
   D. Small red triangles.